

Appl. No. 10/602,556
Arndt. dated December 9, 2003
Second Preliminary Amendment

PATENT

Amendments to the Specification:

Please insert the following paragraph on page 2 line 2, after the title and before the line with the word "FIELD":

--The present application is a continuation of U.S. Non-Provisional Application No. 09/563,660 filed May 2, 2000, (Attorney Docket No. 21751-001600US) which issued as U.S. Patent No. 6,608,631, the entire contents of which are incorporated herein by reference for all purposes.--

Please replace the paragraph on page 2, lines 7-12, with the following paragraph:

--Warping or deforming (the terms are used interchangeably) graphical models is an important operation in many areas of computer graphics. Deformation of planar curves is a basic operation in 2-D cartoon animation as well as in digital publishing. Surface and solid warping find widespread application in solid and geometric model manipulation as well as 3-D animation. Many significant industries such as portions of the entertainment industry and the medical imaging industry rely heavily on suites of computer graphics tools that include warping techniques.--

Please replace the paragraph starting on page 2, line 13 with the following paragraph:

--There are many computer-implemented warping techniques known in the art. Indeed, the literature is heavily populated with niche solutions to seemingly separate sets of problems. There is a need for a warping technique that addresses the general problems encountered in warp design and provides a general solution framework flexible enough, not only for warp designers to rapidly develop new warps, but also for them to achieve warp results comparable to the existing niche solutions when desired. Such a general solution technique would facilitate the comparison of warps, make key aspects of warps easier for the warp designer to understand, and allow a warp designer to increase his or her efficiency by more readily integrating existing solutions for particular aspects of a warp. Ideally, such a general solution technique would not compromise on the warp designer's ability to achieve the same warp results

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as could be obtained with conventional solutions. Still further, it would be desirable for such a general solution technique to enable warp results unobtainable with conventional solutions. Also it would be desirable for such a general solution technique to modify existing warping techniques to add new functionality. Additionally it would be desirable for such a general solution technique to facilitate facilitate analysis of warps for ascertaining desirable mathematical properties.--

Please replace the paragraph on page 4, lines 5-14 with the following paragraph:

--Frequently variations on a (typically complex) surface are desired. Direct manipulation of the surface itself may be too time consuming. There are a number of conventional multiresolution editing schemes that provide some capability for efficient surface variation. However the conventional methods do not allow adequate flexibility (for instance they often restrict the relationship between the fine surface model, e.g., a vertex mesh, and the control model in terms of topology or mesh connectivity). While some conventional methods do allow control models of arbitrary topology, such methods may only approximate the edited control points (rather than being interpolating). However, interpolating warps frequently can provide a more intuitive user interface. Accordingly a need exists for an interpolating warp that may be used to conveniently deform a more complex surface of arbitrary topology.--

Please replace the paragraph on page 8, lines 3-6, with the following paragraph:

--The file of this patent contains at least one drawing executed in color, containing features lined for colors, such as yellow, green, red, and blue. Copies of this patent with color drawing(s) will be provided by the Patent and Trademark Office upon request and payment of the necessary fee. Unless otherwise noted, in the color drawings, source features are indicated in with lining for red, and target features with lining for is blue.--

Please replace the paragraph on page 17, lines 4-8, with the following paragraph:

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--Fig. 3A depicts an undeformed model with a source feature 3100 and a target feature 3200. A strength field is also shown. The strength field is shown with lining for in yellow in the accompanying ~~several~~ figures and the transparency corresponds to value of the strength field; the greater the magnitude of the strength field, the less transparent. As illustrated in Fig. 3A, the strength field falls off radially from a value of 1 at the source feature 3100.--

Please replace the paragraph on page 18, lines 9-16, with the following paragraph:

--Fig. 4A depicts an undeformed model with a first source feature 4100, a first target feature 4200, a second source feature 4300, and a second target feature 4400. A first and second weighting field are shown corresponding to, and centered at, the first source feature 4100 and the second source feature 4300, respectively. The first weighting field is shown with lining for in yellow in the accompanying ~~several~~ figures and the second weighting field is shown with lining for in green. The transparency corresponds to value of the weighting fields as illustrated in Fig. 4A; the weighting fields fall off radially (but at different rates) from 1 at the first source feature 4100 and the second source feature 4300.--